

NOTES ON MYRMECOBLATTA WHEELERI FROM COSTA RICA  
(BLATTARIA: POLYPHAGIDAE)

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ABSTRACT—Myrmecophilous cockroaches have not previously been recorded from Costa Rica. Material collected in 1974 at 4 localities in nests of *Camponotus abdominalis* (F.) ants has been identified as *Myrmecoblatta wheeleri* Hebard based on comparison with the male types of *M. wheeleri* and *M. rehni* Mann. The female of *M. wheeleri* is described for the first time and additional morphological data on the male are provided.

In 1914, W. M. Mann proposed the new genus and species *Myrmecoblatta rehni* Mann from a single male and several females and nymphal cockroaches collected in 1913 from ant nests (*Formica* and *Camponotus*) at Guerrero Mill, Hidalgo, Mexico. Hebard (1917) described *Myrmecoblatta wheeleri* Hebard from 2 males and 2 nymphs collected by W. M. Wheeler in 1912 in a colony of the ant, *Solenopsis gemmata* (F.) at San Lucas Toliman, Solola, Guatemala. No additional records for either species have been published although additional collections have been made.

In February, 1974 a single male cockroach was collected (by FWF) near Cachi, Prov. Cartago, near a nest of *Camponotus* sp. ants. Later a number of cockroach specimens of all life stages were taken (by FFB) at San Juan de Dios de Desamparados, Aserri, and Campus, University of Costa Rica, San Pedro, Prov. San Jose in the nests of *Camponotus abdominalis* (Fabricius). The cockroaches were tentatively identified as *Myrmecoblatta wheeleri* and type-material of the two known species was secured for comparison. Examination of the types confirms the identification in most every detail. The 2 species of *Myrmecoblatta* may be readily separated from each other and from the myrmecophilous genus *Attaphila* Wheeler (1900) by means of the following key which refers to both the brachypterous males and the apterous females, unless males are specifically mentioned.

## KEY TO CERTAIN MYRMECOPHILOUS COCKROACHES

1. Cerci ovoid, unsegmented. Epistomal suture absent; labrum wider than long. Large arolia present ..... *Attaphila* Wheeler
- Cerci stout, but longer than wide, tapering to acute tip, segmentation evident or very poorly marked. Epistomal suture at base of clypeus and clypeus present; labrum spadelike, longer than broad. Arolia absent. (*Myrmecoblatta* Mann) ..... 2
2. Adults and nymphs with epistomal suture markedly arched; clypeus with its proximal (frontoclypeal) margin broadly convex (fig. 1). Cerci relatively slender. Males with tegmina broadly oval in shape, reaching to abdominal tergum VII (fig. 2) ..... *rehni* Mann
- Adults and nymphs with epistomal suture transverse, at about level of anterior tentorial pits; clypeus with its proximal (frontoclypeal) margin sinuous, slightly convex laterally, concave medially (fig. 3). Cerci stout, tapering sharply at tips. Males with tegmina truncate behind, reaching abdominal tergum V (fig. 4) ..... *wheeleri* Hebard

Hebard (1917) noted other valid distinguishing characters separating the 2 species of *Myrmecoblatta* but unless comparison material is at hand they are not readily diagnostic.

The male genitalia from Costa Rican specimens were partially cleared in KOH or NaOH and studied. They are difficult to homologize with other cockroach species, but come closest to McKittrick's (1964) drawings of the male genitalia of *Hypercompsa fieberi* (Bruner). They show an even closer affinity to the genitalia of *Compsodes schwarzi* (Caudell) and *C. eucullatus* (Saussure & Zehntner) which were prepared for comparison. Using the notation of McKittrick (1964) we note the non-retractable genital hook, L3, which ends in a sharp "fishhook". L2-d appears to arise near the base of the left phallomere and at its distal end extends both left and right. The lightly sclerotized left extension links up with the base of L3, while the right (medial) extension is slender, short, strongly sclerotized and narrows to a smoothly pointed tip. Like L3 it can often be seen protruding from uncleared specimens. Another, more proximal, median sclerotized process with roughened, posterior-projecting tip may represent either L1 or R1. In partially cleared specimens it appears to arise from the right side but in fully cleared examples mounted on microscope slides by FFB its origin appears to be on the left side. The sclerites of the right phallomere are generally poorly sclerotized and difficult to make out, although a small pigmented area which may be a portion of R2 is often evident in untreated or partly cleared specimens.

The exposed male genitalia of the type-specimens of *Myrmecoblatta wheeleri* and *M. rehni* were examined, but without clearing in KOH. The hooked L3 of *M. rehni* was similar to *wheeleri* but the projecting portion of L2-d differed in bearing a small slender spine extending from a blunt, rounded tip. The tip of *M. wheeleri* differed from our

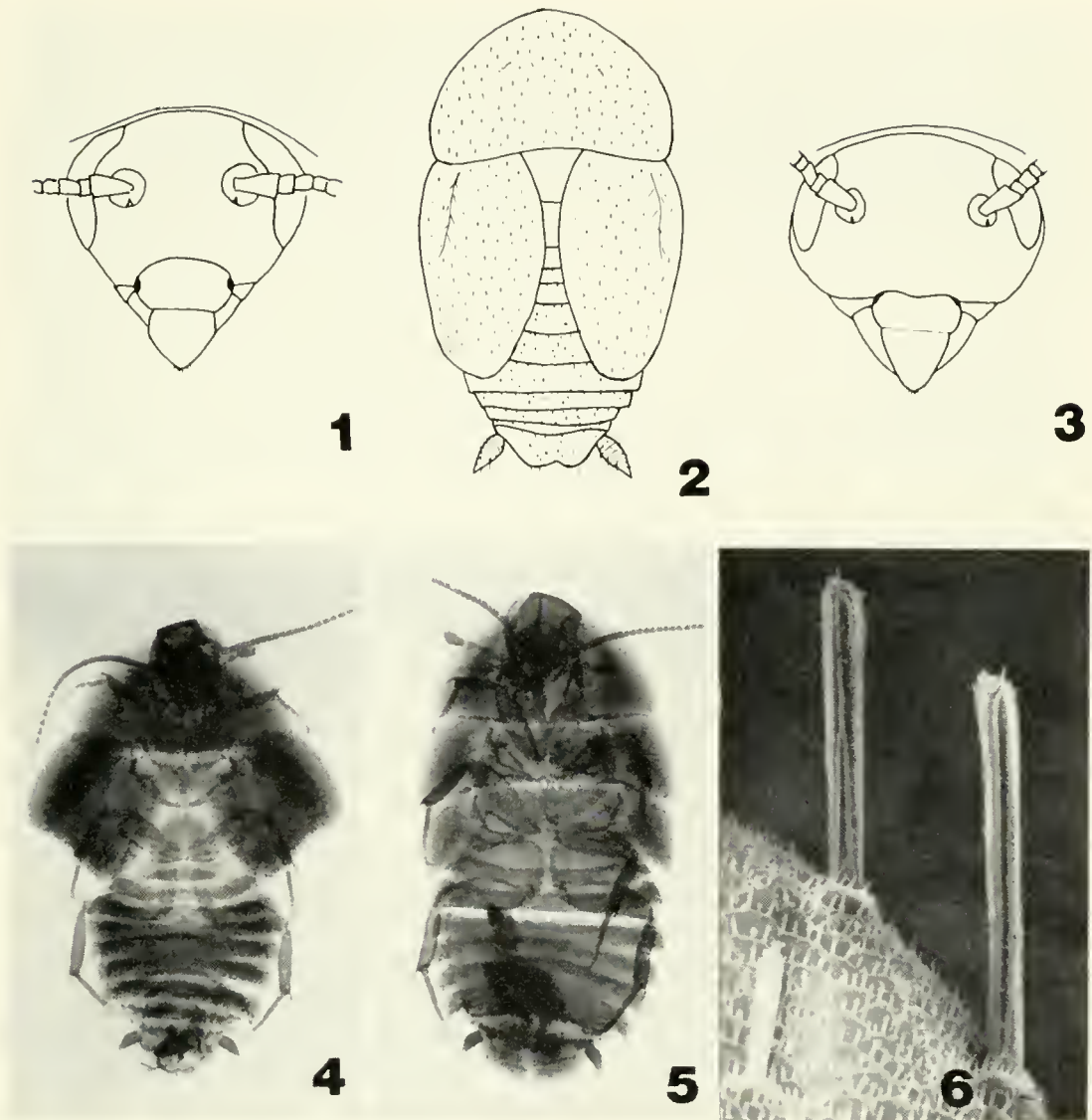


Fig. 1-2. *Myrmecoblatta rehni*, male. 1, front view of head showing epistomal suture. 2, dorsal view. Fig. 3-6. *Myrmecoblatta wheeleri*. 3, female, front view of head showing epistomal suture. 4, male, view through compound microscope. The tegmina normally lie with their medial margins contiguous or slightly overlapping. Note tergal gland, appearing in photo between trochanters of hind legs. 5, female, ventral view. 6, nymph, SEM photo of blunt setae on cercus, 700 $\times$  enlargement.

male specimens in that the right (medial) extension of L2-d appears to have the pointed tip broken off.

On the basis of similarities in male genitalia, female genitalia, proventriculus (fig. 10), and epistomal suture, the genus *Myrmecoblatta* appears to be close to the polyphagid genus *Compsodes*.

A feature of the male *Myrmecoblatta wheeleri* which is only revealed in cleared or dissected specimens and that has not been described is a small median tergal gland (fig. 4, 7) which projects anteriorly from the 4th abdominal tergum but is usually completely



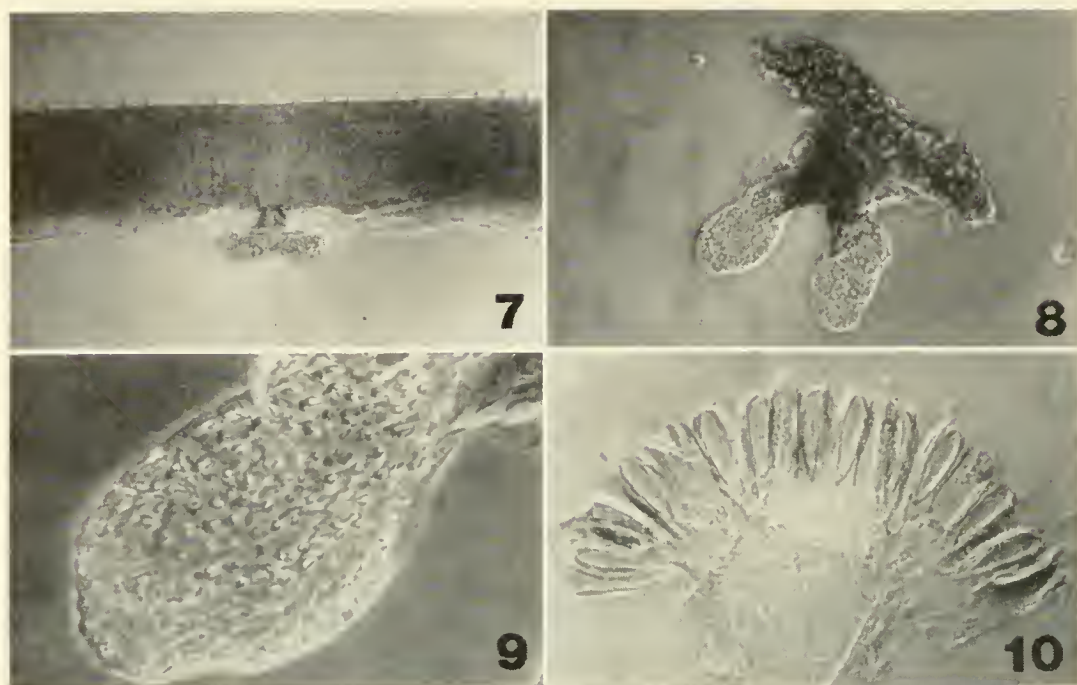


Fig. 7-10. *Myrmecoblatta wheeleri*. 7, male, fourth abdominal tergum showing tergal gland and blunt-tipped setae. 8, male, tergal gland showing cribriform area and gland sacs. 9, male, detail of glandular sac showing microtrichiae. 10, proventriculus, general view.

hidden beneath the 3rd tergum. The gland consists of a cribriform plate with two sacs attached to a common stem (fig. 7, 8). The sacs are lined with numerous very small short microtrichiae arising singly or in groups of two or three, the ones nearer the collar of the sac being larger and stronger (fig. 9).

Abdominal terga II and III also show tergal modifications consisting of narrow cribriform areas along the anterior margin, being more conspicuous towards the sides of the terga. In tergum II there is a slitlike formation on each side. The tergal modifications are more marked on tergum II than on tergum III. Roth (1969) has mentioned that tergal glands are present only in two genera of Polyphagidae, being absent in 19 other genera, indicating also that in one species of *Compsodes* tergum IV is modified. *Myrmecoblatta wheeleri* should be placed in the group of species with male tergal modifications on three abdominal segments, the 2nd, 3rd, and 4th. It was impossible to ascertain whether such a gland exists in the type-males of either *wheeleri* or *rehni* without resorting to destructive procedures. Since females of *M. wheeleri* have not been previously available for description we describe the female as follows.

Female (fig. 3, 5): In nest of *Camponotus abdominalis* (Fabr.), San Juan de Dios de Desamparados, San Jose Province, Costa Rica VIII 4 1974 (FFB, collector). Size minute, form elliptical, apterous. Head reaches anterior margin

of pronotum. Face broad, circular. Interocular space decidedly broader than between antennal sockets, compound eyes small, barely emarginate medially. Ocelli absent. Antennae as noted by Hebard with 1st joint larger than succeeding joints and 2nd joint smaller than succeeding joints. Anterior tentorial pits well marked, with epistomal (frontoclypeal) suture lying between them. With respect to clypeus this suture is convex laterally and slightly concave medially. Clypeus subquadrate with broadly rounded corners, its width approximately twice its depth. Clypeolabral suture poorly defined; labrum narrowly triangular, spade like, its tip concealing mandibles when in closed position. Maxillary palpi with ultimate joint nearly twice as long as penultimate.

Pronotum semicircular in outline, its posterior margin transverse with lateral angles acutely rounded. Meso- and metanotum subequal in size and shape, their posterior margins broadly concave and lateral angles acutely rounded. Lateral margins of abdominal terga I and II and part of III hidden by metanotum. Terga IV to VII exposed and subequal, their lateral angles becoming increasingly acute, with backward-projecting spines on V, VI and VII. Terga VIII and IX not so deep or as wide as preceding. Supra-anal plate transverse anteriorly, broadly convex behind with hint of median emargination. Cerci, as in male, very stout, very weakly segmented, with tips acute. Abdominal sterna regular, transverse with subgenital plate simple, valvular. Legs relatively stout, most surfaces sparsely covered with scattered fine hairs. Definite spines only at tips of tibiae, tips of meso- and metafemora and outer margins of meso- and metatibiae. Ventroanterior margins of front femora with scattered fine setae mixed with a row of minute setae; ventroposterior margins of all femora with a row of evenly spaced fine setae. Tarsi with claws symmetrical and unspecialized; pulvilli and arolia absent.

Color above and below tan, but with coxae and femora of legs and underparts of thorax very much lighter. Anterior and lateral margins of pronotum, lateral margins of meso- and metanotum and very thin median line on thorax and abdomen lighter than ground color. Surface of body supplied with moderately numerous fine setae, randomly scattered on thorax, more or less lined up on abdominal terga and sterna. In both sexes of this species, but not in *M. rehni*, a number of large setae on abdominal terga and cerci do not taper to a point but appear as fluted columns which end in blunt tips (fig. 6, 7).

Measurements (in mm): Body length 5.5, pronotal length 1.8, pronotal width 3.1, max. body width 3.3, hind tibial length 0.9.

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